Title: Object-oriented Design of Simultaneous Bundle Adjustment Software
for the Georectification of Multi-Angle Imaging SpectroRadiometer (MISR) and
Airborne Multi-angle Imaging SpectroRadiometer (AirMISR)

Category: Presentation of Specific IT work at JPL (Science)

Authors & organizations: Mike Smyth - 381

Abstract:

The Multi-Angle Imaging SpectroRadiometer (MISR) is part of NASA's
Terra spacecraft, launched into a polar orbit around Earth on December
18, 1999. MISR is unlike any previous instrument, it acquires
multi-spectral images at nine discrete angles. AirMISR is an airborne
instrument flown on the NASA ER-2, which acquires multi-angle data
similar to MISR. There are a number of challenges in performing
geometric camera calibration, coregistration and geolocation of the
MISR and AirMISR data.

This poster describes the design of the software used to do the camera
calibration and georectification of MISR and AirMISR data. We focus
on a portion of the software: the Simultaneous Bundle Adjustment which
uses automatically collected tie points to perform corrections to the
camera calibration and ephemeris and attitude error models.

The software was our group's first experience with doing an objected
oriented design and implementation. Originally developed for MISR, it
proved highly successful. The software was later extended to work with
a significantly different system, the AirMISR system. The software was
extended with very little change to the underlying architecture,
proving the robustness of the object oriented design.

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